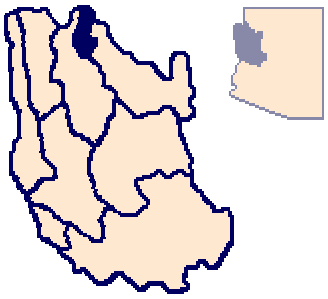
MEADVIEW BASIN



Meadview basin is in northwest Arizona and contains 190 square miles. The basin is elongated from north to south, is six to seven miles wide, and is about 16 miles long (Figure 13). Most of the southern part of the basin is a highland area called Grapevine Mesa. The northern section is a valley formed by Grapevine Wash that drains runoff into Lake Mead. It is bounded on the east by the Grand Wash Cliffs, on the west by the Wheeler Ridge, on the south by the Garnet Mountains, and on the north by Lake Mead.

The floor of the basin slopes from about 4,400 feet above mean sea level at its southern end to about 1,400 feet above mean sea level at Lake Mead. The highest point in the basin is about 6,000 feet above mean sea level along the Grand Wash Cliffs. Grapevine Wash, the main drainage in the basin, is an ephemeral stream with a small perennial reach near Grapevine Spring.

The Muddy Creek Formation has been divided into three units: an upper limestone unit, a middle sandstone/siltstone unit, and a basal conglomerate. The upper unit is a limestone that has good permeability in its lower sections; its upper section is more crystalline and has lower permeability. The middle unit is a sandstone with medium to fine sands and a high clay content. The lower unit is a conglomerate layer with pebble to boulder-sized particles, coarse sand, and silt (Laney, 1979).

The Muddy Creek Formation is the main aquifer in Meadview basin. The limestone unit yields water to some shallow wells and to a number of springs. It is not clear from geologic data if the springs are caused by a perched water table or from an impermeable layer within the limestone (Cella Barr Associates). The middle sandstone unit has a clay content which inhibits its ability to transmit water, therefore, wells in the sandstone unit do not produce as much water as wells from the conglomerate unit (Laney, 1979). Most of the wells draw water from the basal conglomerate unit because of its high hydraulic conductivity. No wells penetrate to the underlying Paleozoic rocks in the basin.

Depth to water varies from 935 feet below land surface near Lake Mead City, to 135 feet below land surface in Grapevine Wash east of Meadview (Remick 1981). Water levels near Meadview are declining at an average rate of about 1 foot per year due to increased pumpage to meet Meadview's growth (Cella Barr Associates, 1985).

Recharge in the basin is slight due to high evapotranspiration rates and low rainfall. Infiltration of runoff from the higher elevations surrounding the basin provide most of the basin's recharge. No estimates are available on the amount of recharge to the basin. Groundwater movement is from the southern highlands to the north towards Lake Mead.

Cella Barr Associates (1985) estimated there are 62,440 acre-feet of recoverable water to 700 feet in storage in the basin. This estimate is very conservative because it assumes a saturated thickness of only 300 feet. Joshua Valley Utility Company is the largest supplier of water in the basin. In 1989, they supplied 71 acre-feet of water, mostly to customers in the Meadview area (Arizona Corporation Commission, 1990). The Arizona Department of Water Resources (1988) estimated groundwater pumpage in the basin at 100 acre-feet per year.

Water quality generally is good throughout the basin. Total dissolved solids (TDS) values range from 240 milligrams per liter (mg/l) to 420 mg/l (Remick, 1981). These totals fall below the recommended secondary maximum contaminant level of 500 mg/l for TDS (U.S. Environmental Protection Agency, 1988). Fluoride concentrations generally are acceptable for drinking water. Concentrations range from 0.9 to 3.4 mg/l.